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## Lower cathelicidin concentrations in Irish athletes compared to controls: a role for vitamin D?

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Despite strong *in vitro* evidence supporting pleiotropic actions of vitamin D in the immune system<sup>(1)</sup>, including synthesis of LL-37 antimicrobial peptide<sup>(2)</sup>, human studies have yielded inconsistent results. LL-37 has been linked with total 25-hydroxyvitamin D [25(OH)D] concentrations and the number of self-reported upper respiratory tract infection symptoms in endurance athletes<sup>(3)</sup>. This observational study investigated whether LL-37 concentration varied between athletes and a general population control group and also tested if total 25(OH)D was a positive predictor of LL-37 concentration.

Overall, 221 stored plasma samples from male and female athletes (*n* 101) and a healthy control group (*n* 120) were obtained from four previous studies and analysed for LL-37 using an ELISA. Total 25(OH)D concentration was quantified by LC-MS/MS during each original study. Prior to statistical analyses, outliers (*n* = 24) were removed.

Measure	Athletes ( <i>n</i> 96)		Healthy controls ( <i>n</i> 101)	
	Mean	SD	Mean	SD
Age, years	21 <sup>a</sup>	3	24	5
Height, cm	170 <sup>b</sup>	10	173	9
Weight, kg	67.50 <sup>a</sup>	12.59	75.17	13.21
BMI, kg/m <sup>2</sup>	23.27 <sup>a</sup>	2.57	25.16	4.38
Total 25(OH)D, nmol/L	59.26 <sup>a</sup>	30.11	35.87	18.93
PTH, pg/mL	39.24	17.10	41.37	18.19
LL-37, ng/mL	29.93 <sup>b</sup>	18.89	43.76	26.63

BMI, body mass index; 25(OH)D, total 25-hydroxyvitamin D, PTH, parathyroid hormone; LL-37, biologically active cathelicidin antimicrobial peptide. <sup>a</sup> *P* < 0.001, <sup>b</sup> *P* < 0.05 versus healthy controls (independent *t* test).

Athletes had a significantly lower mean LL-37 concentration than controls. In contrast, the athlete group exhibited a higher mean total 25(OH)D concentration compared to the control group. Total 25(OH)D concentration did not predict LL-37 concentration overall ( $\beta$  = 0.073, *P* = 0.386), or in either group after adjusting for age, sex, BMI and season of sampling (athletes  $\beta$  = −0.033, *P* = 0.762; controls  $\beta$  = 0.145, *P* = 0.197). These findings question the purported link between vitamin D and LL-37 *in vivo*. Although significantly lower LL-37 concentrations were observed in athletes compared to controls, the clinical implications of this disparity require further investigation.

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1. Baeke F, Etten EV, Overbergh L *et al.* (2007) *Nutr Res Rev* **20**, 106–118.
2. Vandamme D, Landuyt B, Luyten W *et al.* (2012) *Cell Immunol* **280**, 22–35.
3. He C, Handzik M, Fraser WD *et al.* (2013) *Exerc Immunol Rev* **19**, 86–101.